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THE

Journal of the Society of Arts,

AND OF

THE INSTITUTIONS IN UNION.

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Announcements by the Council.

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EXAMINATIONS FOR 1866.

The Programme of Examinations for 1866 is now published, and may be had gratis, on application to the Secretary. A copy has been forwarded to each Institution and Local Board.

Proceedings of the Society.

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MUSICAL EDUCATION COMMITTEE.

The Committee met on the 12th June. Present—Henry Cole, Esq., C.B., in the Chair; Lord Gerald Fitzgerald, the Right Hon. Sir George Clerk, Bart., Sir John Harington, Bart., Sir J. P. Boileau, Bart., Colonel Scott, R.E., Captain Donnelly, R.E., Mr. R. K. Bowley and Mr. R. Puttick.

HENRY F. CHORLEY, Esq., examined by the Committee, as follows:—

316. You have had considerable experience with the subject of education generally, and musical education in particular?—Some experience.

317.—Have you formed any opinions with regard to musical education in this country?—I have.

318. Should you think it right or expedient to attempt, according to the usual practice in this country, to reform an old institution or to create a new one in the case of the Royal Academy of Music?—I am speaking at a moment's warning, because I have not lately thought the matter over, especially in reference to this committee; but most assuredly I would rather the establishment should be built anew from top to bottom, than that it should be repatched, leaving any part of the present fabric untouched.

319. Instead of a reform you would prefer a revolution as regards the Royal Academy of Music?—I should. I have considerable hesitation in expressing my opinions on the subject; as they may give pain to many persons whom I highly esteem and respect as individuals.

320. You consider it would give less pain to individuals to establish the thing anew than to attempt to lead those at present connected with it into a better course if possible?—I do. My own opinion is that it was a mistake on the part of Parliament to accord a grant to the Academy without hearing evidence before a committee. The grant was made in compliance with a petition. We all know that any cause can get any amount of signatures calculated as serviceable. Some sign from intimidation; some from imitation; others in mere thoughtlessness.

321. But this committee finds itself in this position. Here is a Royal Academy of Music, with the Crown at its head, with the patronage of many distinguished personages, though perhaps it does not hold the position in musical eyes which it might: Parliament, in its wisdom, or, as you may think otherwise, has thought it right to endow it with a grant, and the institution exists under the protection of a Royal Charter. Looking at all these circumstances, the committee have to deal with an institution already in existence rather than with any new plan of its own.—Assuredly.

322.—It is also a proper and moot point for consideration whether it would be better to try and improve the existing institution or attempt to establish a new one. We understand your opinion to be in favour of beginning *de novo*?—Certainly, it is so.

323. Have you at all considered the difficulties that would probably attend the formation of a new institution of this kind?—I have considered too many of the evils that have attended the old one.

324. I collect from the paper which you were so good as to read before the Society of Arts, you think that the State ought to recognise a Conservatoire or Musical Academy?—I do.

325. That being so, do you think that Parliament would be likely to give recognition or endowment to two institutions of the kind?—I think if there had been, what I humbly ventured to suggest at the time, such a hearing of evidence as was called for in the case of the question of dramatic monopoly, and has more than once been accorded to the art of Painting, the insufficiency of the Royal Academy would have been proved so strongly that that grant never would have been given.

326. But the grant having been given, the question is if it would be easy to get a second grant for the more perfect institution you contemplate?—in your opinion, would it be safe to attempt that?—You ask me a question that I cannot answer at a moment's warning.

327. Is it not in your opinion possible to renovate the present institution so as to make it tantamount to a new institution?—I think it would be difficult to do so—to the edge of impossibility. Let me repeat that when I have to speak on this subject I feel placed in a delicate

position, as I must give pain to people whom personally I regard very highly.

328. Then we would ask you to give us the benefit of your own theory with regard to what you would consider a better institution?—I must do this by illustration. I think there are radical defects everywhere, mistakes from first to last, in the constitution of the Royal Academy of Music; and I will tell you as well as I can, though disconnectedly, what I think they are. To give one instance, I think it is a vital defect that the presidence of the Academy is so slack, in place of the school being overlooked by a resident superintendent, with no other business than to attend to the concerns of the institution.

329. You do not think it impossible to have a resident superintendent of the Academy?—Assuredly not. It ought to be an established thing that there should be a functionary wholly devoted to such duties.

330. As the principal or head of the establishment?—Perhaps, or merely as a general superintendent; a person to see that the lessons are properly given, and that the whole discipline is properly administered. Then, I think the course of study is a mistaken one. I think it is a mistake that a person who wishes to learn the violin, for instance, should be required to learn other branches of art also. For here is the second clause as stated in the constitution of the Academy:—"All branches of music are taught in the Academy: should the particular branches for which the students enter be harmony, singing, or pianoforte, the male students will be required to learn in addition *any orchestral instrument the committee may require*. I infer from this that a pupil may be required to do a little of everything, and therefore is likely to do nothing good in any special department.

331. You think the system you have described leads to mediocrity?—It has been so proved by the results. Where, to offer a striking example, has any leading female singer come of late from the Academy who is capable of singing Handel's songs so as to take a leading part in oratorios?

332. Admitting the force of your objections, do you think the system irremediable in the Academy?—I think it must be reconstituted entirely.

333. You think it is capable of reform?—Not as the present constitution of the Academy stands.—Then there is a regulation, No. 8, which says, "Advanced students will be required to give instruction in the Academy."—I have a list before me of the professors of the Academy.—There are three in Composition and Harmony of whom the world has never heard anything at all. Here are also six in the singing class that I happen to know have never sung in public at all; some of them are at the present time taking lessons in order to qualify themselves for singing at concerts.

334. And yet they are allowed to teach at the Academy?—There is a strong case I could refer to—the case of a professor in the classes for singing for whom I have the greatest personal and professional regard, and to whom I have sent many private pupils. He has been absent from the Academy the whole winter, and his singing class has been handed over to a deputy. In the pianoforte class I find four or five names whom nobody ever heard of before as pianoforte players; and so throughout the whole list of professors. It would seem that you cannot pay the professors well enough to make them attend to their duties, and hence these are entrusted to incompetent deputies. We see what is the result. An immense disheartening amount of mediocrity. There has not been one commanding English artist, vocal or instrumental, turned out of the Academy during the last twenty-five years; as I, who have to give an account of London music from week to week, feel very vexatiously. For our oratorios, for instance, we must have resort to Mesdames Parepa and Sherrington.

335. They are English ladies are they not?—But not educated in this country. Madame Sherrington was educated in the Conservatoire of Brussels. The last and best English singer from the Academy who has made any high reputation is Madame Sainton Dolby. We have had no other female singers, that I recollect, who are capable of taking a leading part in Handel's music. Our great English soprano, Madame Novello, was educated in York. Mr. Sims Reeves, Mr. Santley, and Mr. Weiss were trained elsewhere.

336. You attribute much of this shortcoming to the constitution of the Academy; will you favour the committee with your views of what the constitution should be?—That is like asking me to frame a new one of my own; this I am not arrogant enough to do on so short a notice. I think in the first place that its principal ought not to be connected with any business.

338. With submission, that hardly refers to the constitution?—I think it does, since it is not provided against. I doubt whether any Committee made up conjointly of amateurs and professional men can ever arrive at anything near to what is good, because on the one side there are all manner of private interests and influences, and on the other side all manner of old traditions.

339. You think there should not be a mixture of amateurs and professionals on the committee?—The smaller the committee the better.—I think the *Conservatoire* of Paris was brought to its present state by the appointment, under the Empire, of Cherubini as its head, with ample power.

340. You think the appointment of a despotic superintendent preferable to the existing constitution of the Royal Academy of Music?—I do.

341. Do you think there should be a committee of management at all?—Yes, for details, but not for perpetual interference.

342. Does your notion of a superintendent go to investing him with powers over the professors?—No; but I think my notion would be that there should be a body of professors appointed; and that once appointed they should not be at liberty to perform their duties by deputy; and that it should be the business of the superintendent to see this regulation not broken.

343. Would you put into the hands of the professors what is called the lay management of the Academy—the looking after the expenditure, the cleaning, and the moral conduct of the students?—I should think the superintendent ought to undertake those duties.

344. Would you have the superintendent appointed by the professors?—No; by the people who find the money for the support of the institution.

345. Supposing the public do, as at present, find the money, do you not think they would require to be represented in some way in the expenditure of it?—I think if a good result was shown after the second or third year, the public would not demur or interfere so as to damage. Inquiry from time to time there will always, and should be. The best answer to this is result.

346. We may collect, from the opinions you have expressed, that you think the institution ought to be aided by the State. Do you think the State should be the whole paymaster, or would you have contributions from the public besides?—I think the whole matter could be presented to the State on some such representation as this. You have to look at the fact of the number of persons who go abroad for their musical education. A young girl (for instance) cannot go to a foreign Conservatoire without her mother or some relative accompanies her. This would be rendered unnecessary, were our home education in the least satisfactory. I think the institution ought to be in part self-supporting.

347. By the fees of the students?—In part by the fees of the students; but based on such a public grant as would secure such good teachers in the Academy as to make it impossible for their duties to be performed by deputy, without making the fees too onerous.

348. And pay them adequately?—Assuredly.

349. Who is to pay them?—I have mentioned a Government grant. There is one now.

350. Would you have the Government undertake the whole pecuniary responsibility?—No; nor do I believe it would undertake it.

351. You would wish the responsibility of the management to be undertaken by the House of Commons?—So far as the Government grant goes, yes. It might fairly, I think, proceed on report.

352. You think that would be more effectual than the present system?—I think there is no very great public displeasure with regard to the present President of the Royal Academy of Arts. There should be a person in a similar position with regard to the Royal Academy of Music. I feel that by dividing and sub-dividing, and having amateurs and professionals too largely mixed up together, both time, money, and progress are frittered away.

353. Is it your opinion that the first grant of £500 was received with such acclamation by the House as to lead you to think it could easily be increased to £5,000?—I know nothing about that.

354. Does it not seem to you the first point should be to "first catch the hare"—*i.e.* the money? If you could get the State to pay the whole expense your theory might be very satisfactory?—I do not see that anything in England wants support that is thoroughly well done. We fling away what would be fortune and opulence to many a worthy institution on waste, experiments, and private favouritism. I am indisposed to go on patching up the old thing year after year.

355. The committee would be very glad to receive your plan for the remodelling of the Academy?—I have said that I am not prepared with it at this moment.

356. You would have no objection, after reflection, to furnish the committee with it in writing?—Perhaps not, if I have time. It will require time.

357. You attribute part of the failure of the Academy as to the results to defects in the constitution. Do you attribute any portion of the failure to incompetency on the part of the professors; to the mode of teaching, or want of ability on the part of those who are taught?—I repeat that one cardinal fault in the constitution is that which allows the professors to evade their duty. There is no doubt that the principal professors are in general well selected; but it appears they are so inadequately paid that they are tempted to wander away and allow persons who are taking lessons to teach their pupils; and I would not allow any professor to absent himself from the Academy without formal permission on sufficient grounds.

358. If they are not sufficiently paid must they not necessarily go away from the Academy?—It comes to that, no doubt.

359. How would you get the money to pay them adequately, and prevent their leaving?—I repeat my belief, that if you had a really sound institution to begin with you would have no difficulty in getting the money from sources partly public and partly private.

360. With such an institution as you would sketch out calmly, do you think the money might be obtained to carry it out?—I do not believe the want of money would be any difficulty, because I see perpetually in my intercourse with the musical and amateur world, and have seen, how magnificently students going abroad to get their musical education, because they cannot obtain it here, have been assisted. We ought to have the best musical education in the world. With all the variety of professors of the first class resident here, we ought to give a thoroughly good and cheap musical education in this country.

361. The committee would be glad to receive your ideas of a system which should obviate the necessity of people going abroad to get their musical education; and they would be glad to know if that could best be done by uniting that which was good abroad with that which exists here. Assuming that by some mode or other sufficient funds are obtainable to give a good musical education in this country, I would proceed to ask you in detail upon some of the points in your paper before the Society of Arts. I gather that you would like to have the endowment for scholarships?—I do not see why this should not be. If pupils have turned out well, I do not see why they should not have the benefit of travelling for a couple of years. A composer or violinist might go to Germany, a singer might go to France or Italy.

362. Are you in favour of students paying fees?—Assuredly.

363. Probably graduated fees?—That would be best, I think.

364. And students of rare ability paying no fees at all?—Surely so, when justified by examination and circumstance.

365. Going a step farther than that—supporting them also?—I don't know. That is a delicate question.

366. If a benevolent musical man thought proper to bequeath £1000 to the Academy to endow a scholarship, you would see no objection to the institution accepting it?—Certainly not. On the contrary, that is the basis on which many institutions have been raised and extended.

367. Are you aware that at Leipsic the endowments are small, and that the chief support of the academy there is derived from the fees of the students?—And why should it be that English students should have to go to Leipsic for what they cannot get so well at home?

368. You would wish to see a good library in connection with the Royal Academy?—I would. To return for a moment: we were discussing the other day what should be done with a new Mendelssohn scholar, and it was decided that he should be sent to Leipsic. In our Royal Academy of Music there is no professor of the German language, nor of French, and people who have to prepare themselves to sing in these languages must go either to France or Germany. I would have such an education in a central academy of the leading metropolis of the world, as to enable the pupils to sing in the foreign languages most required in music, especially Italian. I think the pupils ought to have access to professors who could teach them properly to pronounce in the three languages in which they would have to sing, and not least of all in their own. I could name compositions by professors at present attached to the Academy, which make it obvious that they comprehend neither the poetry nor the prosody of their own language. I would have no such person sing, or teach singing, or instruct in composition.

369. The reforms or improvements at which you glance would, of course, entail a largely-increased expenditure?—If there was a good grant to a really good thing I don't believe it would be grudged by the public.

370. What would you call a good grant?—You ask me to reconstitute the Academy, and state what the professors should have for certain duties.

371. Supposing you, as a person devoted to music, went to Parliament, you would go with a definite demand?—I cannot answer you at the moment.

372. Perhaps you will give us your ideas on the subject hereafter?—I may say I think there ought to be something like £10,000 a-year voted by Parliament for music, considering the place and progress of that art in this country; and I think for that sum it could be done most completely and perfectly.

373. Would you make the payment of the whole or part of that sum conditional on the work done, or would you pay the whole sum in faith?—I would pay it in faith, perhaps. When we see how much painting, including design, has received in aid, if one art is aided by money the other ought to be aided also.

374. For how long a time would you say should the money be paid in faith?—That I cannot say; I am not ready with a working plan.

375. What should you consider would be a fair period for the experiment, three, five, or ten years?—I would

rather have the money paid a couple of years beforehand, so as to get the new Academy well organised and arranged, and not started as a scheme rushed into in a hurry.

376. Supposing you failed in making Parliament as enthusiastic as yourself on this subject, would you abandon all efforts to improve the existing institution?—I have a great notion that what was said during the discussion upon my paper here is true, that it is no use to mend an old coat.

377. Assuming a new coat is to be made, one question is, if you would call upon Parliament to be the only tailor?—No; I presume the students would put the buttons on, and the public help at the lining.

378. Would you put the entire responsibility of the expenditure upon Parliament?—I have said not; but I would have Parliament grant a liberal vote.

379. Do you assume, with the present grant of £500, and with a less grant than £10,000, all efforts to improve the present Academy should be abandoned?—I see no chance of improvement without demolition. I think if there is to be a government establishment for the advancement of a great art, it ought not to be done in a peddling twopenny-halfpenny way. I know that many private individuals are ready and anxious to give their aid, without personal interest or desire for notoriety. Meanwhile I am frequently asked, with regard to persons who have good voices and good musical talents, "Where shall we send them?" Certainly not to the Royal Academy. I would rather bide my time and send them abroad, than say a word to aid in patching up the old system.

380. Taking the condition of the Royal Academy of Music to be at present at zero, do you consider it to be quite incapable of resuscitation under its present constitution?—I repeat it would be a very difficult thing to do—verging on impossibility.

381. You think, with an income of £10,000 a year, such an institution as you would approve of must be efficiently supported?—Yes, certainly.

382. In the event of Parliament refusing such a grant as you would consider proper, would you still supplement the resources of the Academy by public subscriptions and the fees of the students?—Certainly; I do not think it would be a good thing to make an establishment of pauper scholars.

383. You would supplement the present or any moderately increased government grant by the subscriptions of the public?—Certainly.

384. We gather that your objections to the present constitution of the Academy are, first, the want of a resident superintendent? In your opinion, should the superintendent necessarily be a professional musical man, or merely a person of good general and business qualifications?—He should be a person who had nothing else to do but to superintend the proceedings of the Academy.

385. Should he necessarily be a member of the musical profession?—That is a question I am not prepared to answer.

386. You think it is not strictly essential?—Not necessarily so, but he should be a person whose interest and desire it would be that the whole duties of the Academy were regularly and properly performed.

327. Are you aware that up to a recent period there has been a resident superintendent of the Academy fulfilling the duties you have indicated?—Yes.

388. Then in theory the system was right, though practically it did not work well?—I think the person at the head of such an establishment should be a shrewd, clever man. The theory can hardly be put in practice under the existing constitution.

389.—Your next objection to the present system we understand to be that the students are required to learn other branches of music than that to which they wish specially to devote themselves?—They are required to do too much.

390.—Do you think it a disadvantage to a singer that he should be able to play the pianoforte?—Oh, no.

391. Or that he should understand the principles of harmony?—Certainly not. But if a pupil enters for the violin, I do not see the advantage of his being compelled to learn the pianoforte or the bassoon to eke out the orchestra.

(Sir George Clerk: He is not obliged to learn the pianoforte; the converse is the case.

Mr. Chorley: He must learn whatever orchestral instrument is wanted to fill up the band. Quotes Regulation No. 2.)

392. Do you think it a disadvantage to a singer to be able to accompany himself on the pianoforte?—I have said certainly not; but I do not think it should be made obligatory upon the students beyond a limited point. Some of the best singers in the world are not able to play at all. Pasta was a great singer, yet I never heard of her accompanying herself.

393. The next point you mentioned was, that advanced students are required, if capable, to give instruction?—I have an objection to instruction by deputy, and by pupil teachers entirely, for this reason, that for young pupils the best and most experienced masters are wanted.

394. Are you aware that the pupil-teachers only give instruction in what is called the second branches of study?—I think that should be the work of the professors.

395. Have you examined the whole system of the Academy in detail?—Yes; by having closely watched and tested the results; and I would not allow a pupil belonging to me to remain there a month if he were not under the principal professors.

396. Were you ever inside the Academy?—A good deal in former years.

397. Not lately?—No.

398. Are you aware whether any changes and improvements have taken place since you were there?—I see no proof of the latter. I have been at three or four of the concerts, and they are less satisfactory than they were twenty-five years ago. And this brings me to another point: I cannot think that the pupils at the Academy should be allowed to tire their voices by singing elsewhere.

399. You think they prematurely bring themselves forward?—Certainly; since I perceive they are allowed to perform at concerts elsewhere. My notion of carrying on the Academy would be that the pupils should not be allowed to take engagements on their own behalf, or go about performing till they were accredited as ripe. While I would make the professors more easy and comfortable, I would make the students' discipline more stringent.

400. With the £10,000 you think the practice and discipline of the Academy could be made as strict and as efficient as you could desire?—I think if the suggested principle were worked out you would arrive at something near it; but, so far as I can understand, there is no discipline at all, and every pupil can get permission to go where he likes.

401. Are you aware, with regard to the instrumental pupils, that a great number of them are employed in the opera and Philharmonic orchestras?—No doubt; but I cannot remember one great instrumental player the Academy has turned out during the last 25 years. I should like to know one.

402. Are there any other objections beyond those you have stated to the system in the Royal Academy?—I think the first thing is the want of a resident superintendent; the second, the teaching by deputy; and the third, allowing the pupils to take engagements while they are students and before their education is finished.

403. In whom would you rest the appointment of the superintendent? With the duties you would assign it would be a position of great responsibility.—Assuredly, and a very difficult one.

404. But there must be a governing body of the Academy of some sort. What in your opinion should be the action of the governing body? Should the government be in one person or in a committee?—A small committee consisting of as few members as possible.

405. About the same number as there are trustees of the National Gallery?—Something of that kind, perhaps; as limited as possible.

406. Would you consider it beyond human power to obtain a new charter for the Academy?—There is no telling what human power could do.

407. You would not object to the title of "Royal Academy of Music?"—Surely not.

408. Is it your opinion that there should be a head and responsible professor in each department? Do you think, for instance, there should be a head singing master?—I think that the professors should be responsible for their pupils till their education is finished; and that when the pupils go to receive their lessons they ought always to find the professors who undertake to teach them there, and that no change from caprice should be allowed on one side or the other.—I think the pupils should not be allowed to evade lessons by taking engagements elsewhere.—I think there should be perfect order and system in the instruction, and the lessons should be given with the greatest regularity; and there should be a person in general authority resident in the Academy to whom appeal could be made both by professors and students.

I cannot permit this revised report of my evidence to go out to the public without respectfully stating that I met the committee without the slightest idea of being put under examination, and that while I have not altered or modified a single opinion which I felt it my duty to offer, on the spur of the moment—merely confining myself to the correction and removal of verbiage, and to an addition or two made for the sake of distinctness —I feel the incompleteness of my testimony on many points which I consider of importance.

HENRY F. CHORLEY.

Full opportunity will be afforded to Mr. Chorley to complete his testimony.

P. LE NEVE FOSTER.

BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

BIRMINGHAM, 1865.

The thirty-fifth meeting of the British Association commenced on Wednesday, the 6th instant, under the presidency of John Phillips, M.A., F.R.S., Professor of Geology in the University of Oxford.

A meeting of the General Committee was held at one o'clock, Sir Charles Lyell (the retiring President) in the chair. The financial report showed that the receipts of the Association for the past year were £3,831, and that there was an available balance of £759 in the treasurer's hands. A long discussion took place on a motion made by Dr. Hunt, and seconded by Sir Edward Belcher, to the effect that a separate section be formed, to be devoted to the Science of Anthropology. The motion was ultimately negatived.

At the general meeting in the evening the President delivered the opening address, of which the following are some of the most interesting portions:—

"Assembled for the third time in this busy centre of industrious England, amid the roar of engines and the clang of hammers, where the strongest powers of nature are trained to work in the fairy chains of art, how softly falls upon the ear the accent of science, the friend of that art and the guide of that industry! Here, where Priestley analysed the air, and Watt obtained the mastery over steam, it well becomes the students of nature to gather round the standard which they carried so far into the fields of knowledge. And when, on other occasions, we meet in quiet colleges and academic halls, how gladly welcome is the union of fresh discoveries and new inventions with the solid and venerable truths which are there treasured and taught. Long may such unions last—the fair alliance of cultivated thought and practical skill—for by it labour is dignified and science fertilised, and the condition of human society exalted!

"Through this happy union of science and art, the young life of the British Association—one-third of a century—has been illustrated by discoveries and enriched by useful inventions in a degree never surpassed. How else could we have gained that knowledge of the laws of nature which has added to the working strength of a thousand millions of men the mightier power of steam, extracted from the buried ruins of primeval forests their treasured elements of heat and light and colour, and brought under the control of the human finger, and converted into a messenger of man's gentlest thoughts the dangerous mystery of the lightning."

The President discussed the question of the velocity of light, and explained why "the distance of the earth from the sun must be reduced from above ninety-five to less than ninety-three millions of miles, and by this scale the other space-measures of the solar system, excepting the diameter of the earth and the distance and diameter of the moon, would be corrected."

* * * * * * *

"Spectral analysis, that new and powerful instrument of chemical research for which we are indebted to Kirchhoff, has been taught by our countrymen to scrutinise not only planets and stars, but even to reveal the constitution of the nebulæ, those mysterious masses out of which it has been thought new suns and planets might be evolved. The latest results of spectral analysis of stars and nebulæ by Mr. Huggins and Professor W. A. Miller, show that the nebulæ are indeed found to have in some instances stellar points, but they are not stars; the whole resembles an enormous mass of luminous gas, with an interrupted spectrum of three lines, probably agreeing with nitrogen, hydrogen, and a substance at present unknown. Stars tested by the same accurate hands are found to have a constitution like that of our own sun, and, like it, to show the presence of several terrestrial elements—as sodium, magnesium, iron, and very often hydrogen.

"To aid researches into the condition of celestial bodies, the new powers of light, discovered by Niepce, Daguerre, and Talbot have been employed by Bond, Draper, De la Rue, and other astronomers. To our countryman, in particular, belongs the honour of successful experiments on the rose-coloured flames which extend from certain points of the sun's border during an eclipse; as well as of valuable contributions through the same agency to that enlarged survey of the physical aspect of the moon, which, since 1852, the Association has striven to promote."

* * * * * * *

"As we ascend above the earth, heat, moisture, and magnetic force decrease, the velocity of wind augments, and the proportion of oxygen and nitrogen remains the same. The decrease of heat as we rise into the air is no new subject of inquiry, nor have the views respecting it been very limited or very accordant. Leslie considered it mathematically in relation to pressure; Humboldt gave the result of a large inquiry at points on the earth's surface, unequally elevated above the sea; and finally, Mr. Glaisher and Mr. Coxwell, during many balloon ascents to the zones of life-destroying cold, far above our mountain tops, have obtained innumerable data, in all seasons of the year, through a vast range of vertical height. The result is to show much more rapid decrease near the earth, much slower decrease at greater elevations. The proportion of carbonic acid gas in the atmosphere at great heights is not yet ascertained."

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" Researches of every kind have so enriched meteorology since our early friend, Professor J. Forbes, printed his suggestive reports on that subject; and so great have been the benefits conferred on it by the electric telegraph, that at this moment in M. Leverrier's observatory at Paris, and the office so lately presided over by Admiral Fitzroy in London, the messages are arriving from all parts of Europe to declare the present weather, and furnish grounds for reasonable expectation of the next probable change. The gentle spirit which employed this knowledge in the cause of humanity has passed away, leaving an example of unselfish devotion in a work which must not fail through any lack of energy on the part of this Association, the Royal Society, or the Government."

Having touched on various other subjects, the President passed on to the consideration of the present state of geological science. On the question of the antiquity of organic life on the earth, he said:—

" Was the earth ever uninhabited, after it became a globe turning on its axis and revolving round the sun? Was there ever a period since land and sea were separated —a period which we can trace—when the land was not shaded by plants, the ocean not alive with animals? The answer, as it comes to us from the latest observation, declares that in the lowest deposits of the most ancient seas in the stratified crust of the globe, the monuments of life remain. They extend to the earliest sediments of water, now in part so changed as to appear like the products of fire. What life? Only the simpler and less specially organised fabrics have as yet rewarded research among these old Laurentian rocks—only the aggregated structures of Foraminifera have been found in what, for the present at least, must be accepted as the first deposits of the oldest sea.

" Then step by step we are guided through the old Cambrian and Silurian systems, rich in Trilobites and Brachiopoda, the delights of Salter and Davidson; with Agassiz and Miller and Egerton we read the history of the strange old fishes of the Devonian rocks; Brongniart, and Göppert, and Dawson, and Binney, and Hooker unveil the mystery of the mighty forests now converted to coal; Mantell and Owen and Huxley restore for us the giant reptiles of the Lias, the Oolite, and the Wealden; Edwards and Wright almost revive the beauteous corals and echinodermata; which with all the preceding tribes have come and gone before the dawn of the later periods, when fragments of mammoths and hippopotami were buried in caves and river sediments to reward the researches of Cuvier and Buckland, Prestwich and Christy, Lartet and Falconer.

" And what is the latest term in this long series of successive existence? Surely the monuments of ever-advancing art—the temples whose origin is in caverns of the rocks; the cities which have taken the place of holes in the ground, or heaps of stones and timber in a lake; the ships which have outgrown the canoe, as *that* was modelled from the floating trunk of a tree, are sufficient proof of the late arrival of man upon the earth, after it had undergone many changes and had become adapted to his physical, intellectual, and moral nature. Compared with the periods which elapsed in the accomplishment of these changes, how short is the date of those yet standing monoliths, cromlechs, and circles of unhewn stone which are the oldest of human structures raised in Western Europe, or of those more regular fabrics which attest the early importance of the monarchs and people of Egypt, Assyria, and some parts of America! Yet tried by monuments of natural events which happened within the age of man, the human family is old enough in Western Europe to have been sheltered by caverns in the rocks, while herds of reindeer roamed in Southern France, and bears and hyænas were denizens of the South of England. More than this, remains of the rudest human art ever seen are certainly found buried with and are thought to belong to races who lived contemporaneously with the mammoth and rhinoceros, and experienced the cold of a Gallic or British winter, from which the woolly covering of the wild animals was a fitting protection."

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" Various questions of romantic interest in the study of the distribution and languages of the family of man are part of a large circle of the inquiry which finds sympathy in several of our sections, especially those devoted to Zoology, Physiology, and Ethnology. Let us not expect or desire for them a very quick, or, at present, a very definite settlement. Deep shadows have gathered over all the earlier ages of mankind, which perhaps still longer periods of time may not avail to remove."

After further enlarging on the question of the antiquity of man, the President passed to the consideration of the analogy existing among all parts of the animal kingdom, and in a general sense among all the forms of life, which had become more and more the subject of special study.

" Whether what we call species are so many original creations or derivations from a few types or one type, is discussed at length in the elegant treatise of Darwin,[*] himself a naturalist of eminent rank. It had been often discussed before. Nor will any one think lightly of such inquiries, who remembers the essay of Linnæus, " De Telluris orbis incremento," or the investigations of Brown, Pritchard, Forbes, Agassiz, and Hooker regarding the local origin of various species, genera, and families of plants and animals, both on the land and in the sea. Still less will he be disposed to undervalue its importance, when he reflects on the many successive races of living forms more or less resembling our existing quadrupeds, reptiles, fishes, and mollusca, which appear to have occupied definite and different parts of the depths of ancient time. Is the living elephant of Ceylon the lineal descendant of that mammoth which roamed over Siberia and Europe, and North America, or of one of those sub-Himalayan tribes which Dr. Falconer has made known, or was it a species dwelling only in circumpolar regions? Can our domestic cattle, horses, and dogs, our beasts of chace and our beasts of prey, be traced back to their source in older types, contemporaries of the urus, megaceros, and hyæna on the plains of Europe? If so, what range of variation in structure does it indicate? if not so, by what characters are the living races separated from those of earlier date?

" Specific questions of this kind must be answered, before the general proposition, that the forms of life are indefinitely variable with time and circumstance, can be even examined by the light of adequate evidence. That such evidence will be gathered and rightly interpreted, I for one neither doubt nor fear.

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" How important, in the view of this and many other questions, is that never-tiring spirit of geographical and maritime discovery, to which through four hundred years Europe has sent her noblest sons and her most famous expeditions; sent them, alas! too often to an early grave. Alas! for Franklin, who carried the magnetic flag into the icy sea from which he had already brought trophies to science! Alas! for Speke, who came home with honour from the head waters of the Nile! Forgotten they can never be, whenever on occasions like this, we mourn the absence of our bravest and our best; praise, never-ending praise be theirs, while men retain the generous impulse which prompts them to enterprises worthy of their country and beneficial to mankind.

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" Waves—their origin, the mechanism of their motion, their velocity, their elevation, the resistance they offer to vessels of given form, these subjects have been firmly kept in view by the Association, since first Professor Challis reported on the mathematical problems they suggest, and Sir J. Robinson and Mr. Scott Russell undertook to study them experimentally. Out of this inquiry has come a better knowledge of the forms which ought to be given to the 'lines' of ships, followed by swifter passages across the sea, both by sailing vessels and steamers, of larger size and greater lengths than were ever tried before."

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[*] On the Origin of Species, 1859.

After referring to the labours of the British Association in various other directions, particularly in the promotion of meteorological science, the President went on to say :—

"When we enter the domain of practical art, and apply scientific methods to test a great process of manufacture, we do not fail of success; because we are able to join in united exertion the laborious cultivators of science and the scientific employers of labour.

"Am I asked to give an example? Let it be iron, the one substance by the possession of which, by the true knowledge and right use of which, more than by any other thing, our national greatness is supported. What are the ores of iron—what the peculiarities and improvements of the smelting processes—what the quality of the iron—its chemical composition—its strength in columns and girders as cast-iron; in rails and boiler plate, in tubes, and chains, as wrought iron—what are the best forms in which to employ it, the best methods of preserving it from decay;—these and many other questions are answered by special reports in our volumes, bearing the names of Barlow, Mallet, Porter, Fairbairn, Bunsen, Playfair, Percy, Budd, Hodgkinson, Thomson; and very numerous other communications from Lucas, Fairbairn, Cooper, Nicholson, Price, Crane, Hartley, Davy, Mushet, Hawkes, Penny, Scoresby, Dawes, Calvert, Clark, Cox, Hodgkinson, May, Schafhaeutl, Johnston, Clay, and Boutigny. Beyond a question, a reader of such of these valuable documents as relate to the strength of iron, in its various forms, would be far better informed of the right course to be followed in experiments on armour-plated ships and forts to resist assault, and in the construction of ordnance to attack them, than he is likely to be from merely witnessing a thousand trials of the cannon against the target. Anyone who remembers what the iron furnace was forty years ago, and knows its present power of work; or who contrasts the rolling mills and hammers of other days with the beautiful machines, which now, with the gentlest motion but irresistible force, compel the strong metal to take up the most delicately moulded form; will acknowledge, that within the period since the British Association began to set itself to the task of reconciling the separated powers of Theory and Experience, there has been a total change in the aspect of each, to the great advantage of both."

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The President concluded as follows :—

"Such, gentlemen, are some of the thoughts which fill the minds of those who, like our Brewster, and Harcourt, and Forbes, and Murchison, and Daubeny, stood, anxious but hopeful, by the cradle of this British Association; and who now meet to judge of its strength and measure its progress. When, more than thirty years ago, this Parliament of Science came into being, its first child-language was employed to ask questions of Nature; now, in riper years, it founds on the answers received further and more definite inquiries directed to the same prolific source of useful knowledge. Of researches in science completed, in progress, or in beginning, each of our annual volumes contains some three hundred or more passing notices, or full and permanent records. This digest and monument of our labours is indeed in some respects incomplete, since it does not always contain the narrative or the result of undertakings which we started, or fostered, or sustained; and I own to having experienced on this account once or twice a feeling of regret. But the regret was soon lost in the gratification of knowing that other and equally beneficial channels of publication had been found, and that by these examples it was proved how truly the association kept to the real purpose of its foundation, 'the advancement of science,' and how heartily it rejoiced in this advancement without looking too closely to its own share in the triumph. Here, indeed, is the stronghold of the British Association. Wherever and by whatever means sound learning and useful knowledge are advanced, there to us are friends. Whoever is privileged to step beyond his fellows on the road of scientific discovery, will receive our applause, and, if need be, our help. Welcoming and joining in the labour of all, we shall keep our place among those who clear the roads and remove the obstacles from the paths of science; and whatever be our own success in the rich fields which lie before us, however little we may now know, we shall prove that in this our day we knew at least the value of knowledge, and joined hearts and hands in the endeavour to promote it."

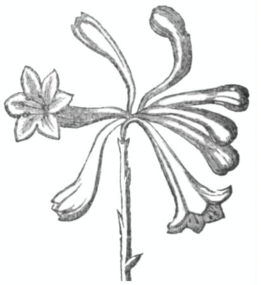
ON THE COMMERCIAL USE OF FLOWERS.

By EUGENE RIMMEL.

(Author of the "Book of Perfumes," &c.)

(*Continued from page* 649.)

The number of flowers used for perfumery purposes has hitherto been limited to seven, viz., rose, jasmin, orange, violet, jonquil, tuberose, and cassie. The rose used is the hundred-leaved rose (*Rosa centifolia*), the jasmine is the *Jasminum grandiflorum*, the orange is the bitter orange (*Citrus bigaradia*), and the violet the *Viola odorata*, or double parma violet.



Tuberose (*Polyanthes tuberosa*).

Tuberose (*Polyanthes tuberosa*) and jonquil (*Narcissus jonquila*) are two bulbous plants, and the cassie (*Acacia farnesiana*) a pretty shrub with globular golden flowers, which thrives admirably in the south of France.

Cassie (*Acacia farnesiana*).

Out of those flowers four only are distilled and yield essential oils, viz., rose, orange, jasmine, and cassie. Rose gives the far-famed otto, which is principally made in Turkey, near Adrianople. Orange flowers produce what is called neroly, a name derived from *nero olio*, dark oil, and not, as some people have imagined, from its having been discovered in the time of Nero, for the Romans were totally ignorant of the art of distillation. Jasmine and cassie are only distilled, to my knowledge, in Northern Africa (Algeria and Tunis) and in India, European flowers not possessing a sufficiently intense fragrance.

The aroma of the other flowers is extracted by means of absorption or maceration. Several other flowers besides those named are sometimes submitted to these processes, such as mignionette, lilac, hawthorn, wall-flower, lily, heliotrope, sweet-pea, &c., but the quantities obtained are so small that they have hitherto been mere experiments, and we are still obliged to compound all these perfumes artificially by studying resemblances and affinities, and blending the shades of scent as a painter does the colours on his palette. Thus, for instance, we imitate heliotrope with the aid of vanilla, sweet-pea by a mixture of rose and orange flowers, magnolia with tuberose, orange flower, and a dash of lemon, &c.

Flowers for perfumery purposes are principally grown in the neighbourhood of Grasse, Cannes, and Nice, three towns situated in the South of France, close to each other. The manufacture of perfumery materials forms one of the principal branches of industry in that district, giving employment to upwards of ten thousand people, including many women and children, for whom the work of culling flowers and picking off the stalks is particularly suitable. These flowers are generally grown by small farmers, who contract with the perfumers for their crop, with the exception of orange flowers, which are always sold on the market. The prices flowers realize vary a good deal, according to the abundance of the crop. They average as follows:—

		s.	d.		s.	d.	per lb.
Roses	from	0	4	to	0	8	,,
Orange flowers ..	,,	0	6	,,	0	10	,,
Jasmines...........	,,	1	0	,,	1	6	,,
Violets	,,	1	6	,,	2	6	,,
Tuberose	,,	1	3	,,	2	0	,,
Cassie..............	,,	2	0	,,	3	0	,,
Jonquils...........	,,	1	0	,,	1	6	,,

The following are approximate quantities and values of the flowers consumed for perfumery purposes in that locality alone:—

	lbs.		£
Orange flowers.	2,000,000	worth about	50,000
Roses	600,000	,,	15,000
Jasmines........	150,000	,,	8,000
Violets	60,000	,,	6,000
Cassie............	80,000	,,	6,000
Tuberose	40,000	,,	3,000

The principal plants from which essential oils are made are lavender (*Lavandula vera*), spike (*Lavandula spica*), peppermint (*Mentha piperita*), rosemary (*Rosmarinus officinalis*), thyme (*Thymus vulgaris*), wild thyme (*Thymus serpyllum*), and marjoram (*Origana majorana*), which all grow wild in the neighbouring mountains, and are distilled on the spot by means of portable stills. An essential oil is also extracted from geranium (*Pelargonium odoratissimum*), which, from its strong *rosy* flavour is much prized by perfumers, and the bitter orange leaves yield a powerful essence named *Petit-grain*, which is used in eau de Cologne. The following table gives the average quantities of flowers and plants required to make 1lb. of essential oil.

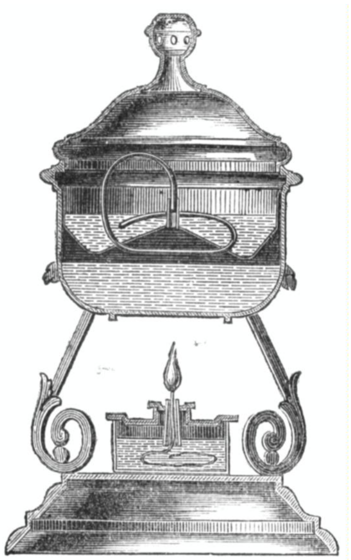
QUANTITIES OF FLOWERS, &C., REQUIRED TO MAKE ONE POUND OF ESSENTIAL OIL.

	lbs.
Roses (*Rosa centifolia*)	10,000
Orange flowers (*Citrus bigaradia*)	1,000
Orange leaves ,, ...	500
Geranium (*Pelargonium odoratissimum*)	500
Lavender (*Lavandula vera*)	120
Spike (*Lavandula spica*)......................	80
Thyme (*Thymus vulgaris*)...................	200
Wild thyme (*Thymus serpyllum*)	200
Rosemary (*Rosmarinus officinalis*)	100

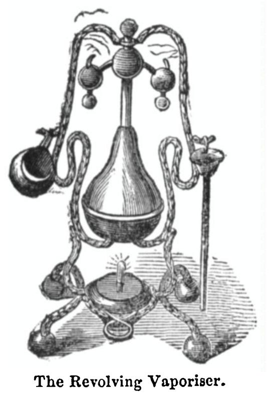
It has been proposed to cultivate flowers in England for perfumery purposes, but the climate renders this scheme totally impracticable. English flowers, however beautiful in form and colour they may be, do not possess the intensity of odour required for extraction, and the greater part of those used in France for perfumery would only grow here in hot-houses. The only flower which might be had in abundance would be the rose, but the smell of it is very faint compared with that of the Southern rose, and the rose-water made in this country can never equal the French in strength. If we add to this the shortness of the flowering season, and the high price of land and labour, we may arrive at the conclusion that such a speculation would be as bad as that of attempting to make wine from English grapes. As a proof of this, I may mention that I had a specimen submitted to me not long since of a perfumed pommade which a lady had attempted to make on a flower-farm, which she had been induced to establish in the north of England, and it was, as I expected, a complete failure. The only two perfumery ingredients in which the English really excel are lavender and peppermint, but that is owing to the very cause which would militate against the success of other flowers in this country, for our moist and moderate climate gives those two plants the mildness of fragrance for which they are prized, whilst in France and other countries they grow strong and rank.

Before I take leave of the subject of distillation, I may be allowed to mention my system of vaporizing perfumes, which is a sort of inverted distillation, for whilst the object of distilling is to concentrate the aroma of fragrant substances, that of vaporizing is to divide it *ad infinitum*. I was led to this discovery in a very curious way. Some years ago, Madame Céleste was bringing out at the Lyceum a new fairy piece, called "Chrystabelle; or, the Rose without a Thorn." The great transformation scene was to represent a bower of roses, and she came to me to ask if I could supply her with some means of diffusing the scent of roses during that scene. My first answer was that it could not be done, as the various systems for perfuming the air had been hitherto confined to the combustion of aromatic gums and woods, which all gave an incense flavour very unlike roses. On thinking over the matter, however, it struck me that steam, owing to its great power of extension, might be used as a vehicle for carrying fragrant molecules in a rapid and powerful manner through the atmosphere. I constructed an apparatus on this principle, and the experiment succeeded so well that the perfume vaporizer has been used extensively since, not only for scenic effects, but also on a reduced scale in ball-rooms, apartments, &c. The peculiar advantage of this system is to give the fragrance of any particular flower in all its purity; thus on the day of the marriage of the Prince of Wales, the reception rooms adjoining St. George's Chapel, which had been perfumed in that way, breathed an atmosphere of violets, though none were to be seen. The potency of these vapours is also so great that a large theatre like Her Majesty's or Covent Garden is entirely filled with them in five minutes. Now, by substituting aromatic plants for flowers, you produce reviving fumes, which have been thought sufficiently prophylactic to be adopted by the Royal College of Surgeons and several hospitals. The question has been discussed and not satisfactorily settled, whether these aromatic fumes *destroy* or only *cover* unpleasant and deleterious smells—but it is very certain that they render them totally imperceptible, and that is a great point gained. There is a very curious fact connected with these scented vapours, which is that the weakest perfume, such as that of violet, is sufficient to overcome a strong persistent smell like that of tobacco. I have often tried this experiment myself by lighting a small vaporizer in a room where several persons had been or were still smoking, and in the course of a few minutes nothing but the perfume was perceptible. I shall feel much obliged to any scientific man who can give me the cause of this phenomenon.

The apparatus usually employed for vaporising perfumes consists in a water-bath containing a pan fitted with a bent pipe, the lower end of which is bored with small holes. Perfumed water is placed in the water-bath, and the prepared scent in the pan; heat is then applied by means of a spirit lamp, and the steam evolved from the water-bath passes through the pipe into the upper vessel, where it meets with the perfume and causes it to rise in a vapour through the apertures on the top. A more simple apparatus is also used where the perfume is merely boiled, and when only required for a few minutes; and in a small room, it answers as well as the other. The revolving vaporizer, a recent modification of the apparatus is placed on a pivot, and has on the top two very small apertures placed in a contrary direction. It is poised in such a way that the steam, as soon as it is generated, rushes through the apertures and causes it to revolve with great rapidity.



Sectional View of Perfume Vaporiser.



The Revolving Vaporiser.

The fourth process I have to describe to you is that of *expression*, which is confined to the fruits of the citrine family, viz., orange (*Citrus aurantium*), bitter orange (*Citrus bigaradia*), lemon (*Citrus medica*), bergamot (*Citrus bergamia*), cedrate (*Citrus cedrata*), and limette (*Citrus limetta*). The rinds of all these fruits contain an essential oil ready formed in small vesicles, and various means are adopted to extract it. On the coast of Genoa they rub the fruit against a grated funnel; in Sicily they press the rind in cloth bags, and in Calabria, where the largest quantity is manufactured, they roll the fruit between two bowls, one placed inside the other, the concave part of the lower and the convex part of the upper being armed with sharp spikes. These bowls revolve in a contrary direction, causing the small vesicles on the surface of the fruit to burst and give up the essence they contain, which is afterwards collected with a sponge. The rinds are also sometimes distilled, but the former processes, which are called in French *au zest*, give a much finer essence.

The three principal essences of this kind used are orange (called also Portugal), lemon, and bergamot, which all enter into the composition of eau de Cologne and many other perfumes. They are made in Calabria and Sicily in the months of October, November, and December, and the quantity of fruits required to made 1 lb. of essential oil varies as follows during that time:—

	October.	November.	December.
Oranges	1,500 ...	2,000 ...	2,300
Lemons	1,500 ...	1,800 ...	2,000
Bergamots	1,800 ...	2,000 ...	2,300

The essence produced by squeezing the rind is yellow; that made with the machine has a green tint. The following quantities are produced yearly on an average:—

	lbs.		Fruits.
Orange ...	300,000	made with about	540,000,000
Lemon ...	500,000	,, ,,	750,000,000
Bergamot	300,000	,, ,,	600,000,000

Perfumery is not the only use to which are put aromatic flowers and plants; vast quantities are also gathered and sold for medicinal purposes, especially on the continent; but as this part of my subject belongs to the domains of pharmacy, I must leave it to be treated by a more competent person than myself.

In conclusion, allow me to return you my very best thanks for your kind and courteous attention, and to say that if any of you feel any particular interest in the subject I have had the pleasure of introducing to your notice, they will find in the book I lately published all particulars respecting the history of ancient and modern perfumery.

Fine Arts.

Paris Exhibition of Fine Arts Applied to Industry.—The collection of porcelain and *faïences* shown here is very remarkable, and includes specimens from almost every country and every style—French, Italian, German, and Oriental, very many of the pieces being of extreme rarity. Amongst the enamels, those of Limoges are naturally the most numerous; but the collection of Italian and other historical works is extremely fine. Next in importance are the classes of furniture, tapestry, ironwork, and other objects of domestic utility and decoration, ranging from the 16th to the 18th century, and in many cases having historic as well as artistic interest. The collection of armour and arms, ancient and modern, European and Oriental, which is already a fine one, will shortly receive a very important addition; the Emperor recently paid a visit to the Exhibition, and offered his fine private collection of arms to the director. The arms in question occupy a special gallery in the Tuileries, and consist of about a thousand pieces, principally of the period of the middle ages and the renaissance. A separate room is being prepared for their reception. The Venetian and other glass forms another important feature in the Exhibition. The carved works in ivory and wood also present many fine specimens of mediæval skill. There are good collections of small bronzes of the 15th, 16th, and 17th centuries; of old German and other silver ware; of enamelled and jewelled snuffboxes; *bonbonnières*, and other small articles. In the modern portion of the Exhibition the works are classed under nine heads:—

Decoration of buildings, wall decorations, furniture, works in metal, precious metals and costly substances, glass and ceramic wares, tissues for clothing and domestic use, miscellaneous articles, including carriages, arms, cutlery, bookbinding, and ornaments; and lastly, printing, engraving, and photography. The iron work applied to architectural and domestic purposes exhibits decided progress, especially that in which the ornamentation is produced by the hammer in the old style. A pair of park gates, pedestals and brackets for lamps, chandeliers, fire-dogs, fire-irons, and many other articles, exhibit great manual dexterity, coupled with simplicity and purity of design. Of chased, enamelled, and decorated goldsmiths' work there are some beautiful examples in the Exhibition; a portable communion service, or *chapelle*, as it is called, in silver gilt, engraved and studded with precious stones, exhibited by M. Geffroy, of which the forms, the engraving, and the whole of the workmanship are solid and extremely elegant; a silver beer tankard decorated with hopbine in *repoussé* work in the old German style, by M. Fannière; a silver gilt casket, ornamented with enamels and set with stones, from the well-known house of Froment Meurice; cups and other articles in steel, chased, engraved, and ornamented in the style of Louis the Thirteenth, by M. Philippe; a noble vase and other works in silver, chased and oxidized, by Rudolphi; silver and plated ware exhibited by M. Veyrat, and many other remarkable works of the same kind. Porcelain and *faïence*, especially the latter, also exhibit the same spirit of artistic revival, not yet quite so fully developed. In the exhibition are many direct reproductions of the works of Palissy and other famous potters, executed with more or less ability, but there are also innumerable specimens of the judicious application of the old styles to modern taste. The large vases and other objects in *faïence* scarcely exhibit so much skill in their manufacture as many of the productions of our own makers, but the decorated slabs and medallions exhibit a rare amount of artistic talent, and in some the colours are perfect, especially the blue. At present the cost of this artistic pottery is high, but it is evident that the time is approaching when they will be brought within the reach of almost everyone, and a brighter and more durable species of decoration it is hardly possible to imagine. French cutlery is another branch of manufacture which is making great strides, and the specimens in the Exhibition deserve special attention. Bronzes, gilt, and other ornamental wares for which Paris has so deserved a reputation are, of course, well represented, but they present no special progress or novelty.

Public Statues in France.—A grand *fête* took place last week at Villiers Bocage, a small place not far from Caen, in Normandy, at the inauguration of the statue of Richard Lenoir, who for forty years laboured with the greatest energy, and did the most signal service for the French cotton manufacture, and yet, after being one of the wealthiest manufacturers in France, and having laid the foundation of thousands of fortunes, died a poor man. The statue, by Louis Rochet, is one of the happiest efforts to give dignity to a costume of the most ungainly and unpromising character; the large frock-coat of the empire, with its square, stiff, prominent collar, which the artist has treated with daring exactitude, artistically seizing upon the ample skirt to break the formality of the effect, and give a flowing form to his outline. Richard Lenoir, besides being an industrial hero, and almost a martyr, engraved his name on the memory of his countrymen by placing himself at the head of his workmen and aiding in the last struggle against the legitimists and their allies in 1815. Villiers Bocages, the place of his birth, does not contain more than twelve hundred inhabitants, but thousands flocked to the inauguration from all parts of France. A statue has also been raised in honour of the astronomer Arago, at his birth-place, Estagel, in the department of the Pyrenées Orientales; the sculptor, M. Oliva, is also a native of the Pyrenées.

Manufactures.

Copper Smoke.—The following is from the *Reader*:—Several ineffectual attempts have been made, during the last fifty years, to abate the nuisance caused by the copper smoke which is given off during the calcining of the ore. Copper-smelters are in the habit of paying large sums as compensation for the damage done to the vegetation in the neighbourhood of their works by the clouds of valuable copper smoke which are allowed to pass into the air. Thousands of pounds are annually wasted in this manner; but up to the present time no plan has been found to answer practically for utilizing the smoke. Messrs. Vivian and Sons, the eminent copper-smelters of Swansea, who have already made great efforts in this direction, are about to adopt an improved roasting furnace, for which the inventor, M. Gerstenhöfer, a chemist of Freiberg, took out a patent in 1863. It has hitherto been the practice to perform the roasting operation either in kilns, grate furnaces, or muffles. In the first case, the stamped ores are mixed with clay or loam, and formed into balls, which are then dried. When muffles are used, the pounded pyrites is spread on plates of fire-clay, and required to be kept continually stirred to expose fresh surfaces to the air. Neither of these processes answers practically. M. Gerstenhöfer's improved furnace is described as consisting of "a vertical chamber, constructed of fire-brick, and fitted with a series of horizontal bearers (formed of fire-brick) distributed evenly through the body of the furnace, for the purpose of intercepting, and thereby distributing the crushed ore as it is discharged through the top of the furnace from suitable feeding boxes. * * * * The upper face of the bearers is made flat, to receive the ore, and after accumulating on the upper bearer it slides off on to those lower down, and so on, until it finally falls to the bottom of the furnace, at which time it is supposed to have parted with its sulphur." The gases, passing out at the mouth of the furnace, are led into a large chamber; first, however, heating the pipes which supply air to the grate, where they deposit "the dust of roasted ores, and also the arsenious acid." The gases are now ready to pass into the ordinary sulphuric acid chambers. The inventor states in his specification that "the Royal Saxon Sulphuric Acid Works have made a trial with a furnace of the improved construction with so great a success that it is now almost exclusively employed for the roasting of pyrites at that establishment." The working of this furnace has been carefully investigated by Messrs. Vivian, who expect to make 1,000 tons of sulphuric acid per week from the copper smoke, which would otherwise be worse than wasted. We are, therefore, not surprised to hear that Messrs. Vivian have paid the inventor £4,000 for his patent right.

Wakefield Industrial and Fine Art Exhibition.—This exhibition was opened by the president, Lord Houghton, on Wednesday, 30th August. The inaugural address was delivered by the president, after which the Archbishop of York and other gentlemen spoke at length on the advantages to be derived from such exhibitions. The building in which the exhibition is held consists of a lare vestibule, with a picture gallery on either side. Besides these galleries, the temporary building contains a large central hall, 100ft. by 60ft., and a refreshment room. The Tammy Hall is entered by steps from the central hall, and contains, besides offices, a lower room with shafting, which, in consequence, has been assigned to machinery in motion; above this is an upper room, the walls of which are covered with a neutral tint. The exhibition is held in six rooms, which contain about 17,000 square feet of floor and table space, and 17,000 square feet of wall space. The number of exhibitors, including the fine arts department and children, amount to 1,300.

Exhibition at the Saracen Foundry, Glasgow.—A private exhibition of the articles produced in the leisure hours of the workmen in this establishment was recently held in the Moulders' Shop, which had been set apart for the purpose. The origin of so novel an attempt was as follows:—For several years back the moulders have been in the habit, on the occasion of their annual excursion in August, of decorating their sand heaps with devices of various kinds, and last year so much talent was displayed in this respect, that the company awarded prizes to the more remarkable of the designs, and intimated that next year they would award prizes to the amount of £22 2s., in connection with a private industrial exhibition in the foundry, which would include not only specimens of the men's own ingenuity, but also that of their families and of their female friends. The employés themselves subscribed an equal amount, and the result was the present exhibition. One rule of the exhibition was a rather noticeable one, namely, that no articles were allowed to be exhibited illustrating the company's manufacture, so that the specimens on view were in an unusual degree the result of natural genius. There were in all eight sections —namely, 1. For the best object in either nature, art, or industry. 2. For the best essay delivered at the Saracen Foundry Mutual Improvement Society during the session 1864 5. 3. For the best object or decoration made in moulding sand by journeyman moulders. For the best object or decoration made in moulding sand by apprentice moulders. 4. For the best specimen of female industry in needlework, knitting, &c. 5. For the best drawing. 6. For the best original composition in prose or verse. 7. For the best writing. 8. For the best specimen of writing by counting-house employés only. In one of these sections there were 36 competitors, and in another 24, and many of the articles shown were such as to reflect highly on the skill and industry of the exhibitors. The third section was in many respects the most interesting of all, comprising as it did numerous and curious designs in moulding sand. The first prize was for an elaborate design illustrative of the parable of the Good Shepherd; and the second for an imitation of Burns' monument. Mr. Walter Macfarlane, of the Saracen Foundry Company, delivered an address, and distributed the prizes.

Commerce.

Coffee.—Messrs. Travers' circular says:—"The progressive decline in the consumption of coffee is surprising, as the quantities of nearly all other articles of produce have become much greater of late years. The home consumption reached its highest point for the last fifteen years in 1854, when it amounted to 16,674 tons; in 1864 it was only 14,000 tons, and we have now to chronicle a decrease of 315 tons for the first six months of 1865, as compared with the corresponding part of 1864. The reduced cost of tea, and the rapid advance it has made in public favour, have principally brought about this result; but, at the same time, the smaller use of coffee may, to a great extent, be traced to the way in which it is generally prepared in England. The preparation of coffee for use requires some little care and attention, which are seldom bestowed upon it by English people. The result is that we, as a nation, drink the worst-flavoured coffee in Europe, although we are supplied with the best raw material, and can pay the best price for it. The preparation of tea, on the other hand, requires little care, and the result is always certain, if enough be put in the pot. Labour being dear and time of value, coffee in England goes to the wall, and tea usurps its place. On the continent the contrary is the case, and coffee is as yet in the ascendant. England is the chief *entrepôt* from which continental supplies are drawn; and we may thus form a tolerably correct inference of the state of consumption abroad by the exports from British ports. These amounted in 1854, when our home consumption was at its highest, to 14,548 tons; but in 1864 amounted to no less than 35,406 tons; and the Board of Trade returns for the six months of this year show a surplus of 1,769 tons in the export deliveries, as compared with the first half of 1864. Coffee planters need thus have no fear of extending their operations at present—the more so as the United States will be more and more in the market. At the same time, we fear that the use of coffee in England will be still further diminished by the late reduction in the tea duty."

Coal Trade in Europe.—The extraction of coal in France in 1863 was estimated at 10 million tons, and the import of foreign coal was 5,344,260 tons; the consumption amounted to 882 lbs. per head. Belgium produced 10 million tons, but exported 3,500,000 tons. The 6½ million tons which it consumes represents 2,822 lbs. per head, or three times as much as France. England produces 86 million tons of coal, of which 7,934,000 tons were exported. The internal consumption, therefore, is about 78 million tons, which represents 6,394 lbs. per head, or about seven times as much as in France. One-third of the coal used in France is imported from England, Belgium, and Prussia.

Clocks and Watches Imported.—From a return recently issued, it appears that in the seven months ended the 31st July, as many as 129,082 clocks *and 86,814* watches were imported free of duty.

Colonies.

Progress in New South Wales.—The increase of population by immigration to New South Wales, from 1860 (after separation from Queensland) to 1864 inclusive, has been—Immigrants, arrived under Government Assisted Immigration Regulations, 15,903; other arrivals from Great Britain, in excess of departures to Great Britain in five years, only 1,495; arrivals by sea from other colonies and foreign ports in excess of departures to same, 480; arrivals by sea of Chinese in excess of departures, 5,721; total, 23,599. Notwithstanding the depression of the times, the purchase of land by free settlers goes on rapidly. The total quantity purchased from the time when the Act came into operation (1st January, 1862) to 30th September, 1864 (2 years and 9 months), being no less than 630,653 acres, and the sum paid as deposits alone during that time amounting to nearly £160,000. The following figures give the number of purchasers and the quantity of land selected in 1864:—

Year.	Acres.	No. of Purchasers.
1862	294,186	4,562
1863	212,035	3,551
1864 to Sept. 30	124,432	1,890
	630,653	10,003

From almost every district the most encouraging statements respecting the progress the colonists are making are received.

Silver Mines in New South Wales.—It has been determined to resume operations at the Mornya Silver Mines by a new process, which has been tried with a model machine on the ores of this mine, and which is stated to have been completely successful in extracting the precious metals. Two trials have been made on the ore with very satisfactory results, the first trial giving four ounces of gold and ten ounces of silver to the ton of ore, and the second trial giving three ounces of gold and fourteen ounces of silver to the ton of ore.

New Tariff in New South Wales.—The act to impose stamp duties would come into operation on the 1st of July. It is estimated that the revenue to be derived from these duties will amount to £150,000. On the 25th May the treasurer proposed an addition of 20 per cent. customs duties on all goods included in the tariff, and a duty of 1s. on all goods imported into the colony. The resolutions submitted to the Assembly met with some opposition, and were amended by exempting tea, sugar, brandy, and gin from the package duty.

Copper Mines in New South Wales.—The reports from these mines continue to be of a satisfactory character. The quality of ore is improving, and the lodes are more productive as depth is obtained.

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City Horticulture.—A recent number of the *Scottish Farmer* says that a large number of influential gentlemen in Edinburgh have lately associated themselves for the support of what may be termed a Working-Class City Horticultural or Window Gardening Society. The promoters of this philanthropic movement issued a circular in March last inviting working people to contribute to a flower show for the working classes living in the various districts of Edinburgh. Prizes of sums from 1s. to 5s. were given, open to working men and women; and prizes from 6d. to 2s., open to boys and girls under 15 years of age. Any flowering plant was admitted. In all, 114 prizes were offered. It appears that there are now, both in Edinburgh and Glasgow, some very successful examples of area gardening, where, considerably under the street levels, healthy and well-grown ferns, including that most elegant of all, the *Osmunda regalis*, as well as many kinds of shrubby, herbaceous, and climbing plants, are thriving in vigorous luxuriance, the evil effects of the street dust and city smoke being counteracted by frequent washings of the foliage, and that generally by merely sprinkling it with water from the finely-drilled rose of a small watering-pan, discharged occasionally shower-like from the higher windows, or over the railings from the street above. With regard to the choice of plants for this purpose, the above-named journal says:—"There are many plants which will not thrive under the best management in town windows, areas, &c.,—let all such be discarded; and we would further recommend working-class cultivators not to be too ambitious in their selection, but to choose from observation those plants most suitable, whether native or exotic, hardy or tender. To juvenile growers of hanging pot plants we would say, have an eye to that hardy and pretty woodland native 'creeping jenny,' also called 'herb twopence,' and still more earnedly *Lysimachia nummularia*. Aspire to the possession of a plant of the recently-introduced hardy Japan honeysuckle, which is unsurpassed for the beauty of its golden lace-like foliage; and do not neglect the common ivy, one of the easiest managed of evergreen creepers, and of which there are now about half a hundred varieties in cultivation, all differing from one another in the colour, form, and size of their leaves; and among these, some with variegated and spotted, as well as peculiarly-formed green foliage, are unsurpassed as flower-pot evergreens, either for growing inside or outside. The general attention now and lately bestowed upon window gardening has been the means of calling forth several highly interesting and useful publications and essays on the subject; foremost among which is the paper read by Mr. John Bell before the Society of Arts last session."

Special Education in France.—The Minister of Public Instruction has just issued a circular to the Prefects of departments announcing the intention of the Government to establish a special normal school at Cluny. The object is to create a class of teachers which neither the high schools of Paris nor the primary normal schools supply, instructed in matters connected with the applied sciences, and able to explain to the pupils not only the principles of industrial operations, but also the methods in actual practice. The new school is to be established in the ancient Benedictine abbey at Cluny, a spot well situated for the purpose, being in the centre of a rich province, where all forms of cultivation are to be found—cornland, meadow, vineyard, and forest, near Creuzot, the seat of a great mechanical industry, on the one hand, and Lyons on the other, and not far from St. Etienne; so that the pupil teachers will be placed in very advantageous circumstances. Candidates are to be admitted by competition, in order that all may be nearly on a par as regards general instruction, and the pupils will receive their diplomas after public examination. The school will be open to all on the above conditions, but the Government will support the pupil teachers required for the Lycées. The departments are called upon to aid the work by applying one or two of the scholarships in each primary normal school to the new establishment, the pupil teachers to be selected from the departmental schools by competition. The modes of carrying out the object in question are not yet fully decided on, but the Minister expresses his intention of proposing to the Emperor that the pupils who pass their examination in the new school shall enjoy a portion of the advantages attaching to University degrees; and announces further that as the professors of the new school must be men of high standing, and as the laboratories, workshops, collections, gardens, and other means of practical study, must be complete, the value of each *bourse* will be higher than in the ordinary normal schools, and he fixes it at eight hundred francs (£32).

Patents.

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From Commissioners of Patents Journal, September 1st.

Grants of Provisional Protection.

Copying presses—1624—P. Lawrence and G. Jeffreys.
Fuel, combustion of in furnaces, &c.—1972—B. Robinson & J. Varley.
Illusory exhibitions—1983—T. W. Tobin and Colonel Stodare.
Iron—1964—E. Sabel.
Iron—1970—W. W. Biggs.
Levels, &c., adjusting—2065—A. Budenberg.
Roofing tiles and slabs—1991—F. Ransome.
Shells, fuses for—1989—A. Noble.
Ships, water-closets for—1740—H. W. Rosser.
Soils, preparation of—1935—T. Spencer.
Spindles, lubrication of—2059—J. H. Radcliffe.
Steam, apparatus for condensing—1180—A. Francis.
Steam, indicating pressure of—1497—F. N. Gisbourne.
Steam valves, conical plug—1956—W. E. Newton.
Water, drawing—1996—J. McEwan and W. Neilson.

Inventions with Complete Specifications Filed.

Alcohols, distilling and rectifying—2203—H. A. Bonneville.
Elastic subttances, compression of—2205—H. A. Bonneville.
Skate, roller—2221—W. P. Gregg.
Velvet—2204—H. A. Bonneville.

Patents Sealed.

608. H. Taylor.
624. F. Cruickshank.
628. W. Riddle.
633. E. W. Young.
635. J. H. Wilson.
652. F. W. Turner.
662. R. G. Fisher.
669. V. Delperdange.
671. E. A. Phillips.
796. W. M. Williams.
813. T. H. Saunders.
952. W. Clark.
1048. G. Jackson.

From Commissioners of Patents Journal, September 5th.

Patents Sealed.

634. R. A. Brooman.
648. J. Shanks.
649. M. Morgans.
660. J. T. Harris.
661. W. H. James.
666. J. Cliff.
675. G. Wright.
680. J. Samuel and S. Millbourn.
693. J. M. Napier.
737. J. Farrar and E. Booth.
757. J. McConnell.
880. A. Chaplin.
901. A. Turner.
980. G. Davies.
1134. J. Howard & E. T. Bousfield.
1562. J. R. Cooper.
1885. G. Nimmo.

Patents on which the Stamp Duty of £50 has been Paid.

2396. F. H. Lefranc.
2401. W. Owen.
2402. P. W. Mackenzie and S. Smith.
2492. G. T. Bousfield.
2414. J. Walker.
2418. E. G. Fitton.
2441. R. A. Brooman.
2540. G. L. Lee.
2440. Eli Dyson.
2910. A. Krupp.
2428. R. Glanville.
2448. H. L. Emery.
2450. J. Platt and W. Richardson.
2519. H. Higgins.

Patents on which the Stamp Duty of £100 has been paid.

1965. J. L. Clark, F. Braithwaite, and G. E. Preece.
1971. M. A. F. Mennons.
1987. W. Warne.
2001. G. T. Bousfield.
1980. A. V. Newton.
1988. A. V. Newton.
1985. J. Sloper.